TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Advanced Planning Briefing for Academia
APBA

Condition Based Maintenance

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Current Failure Management Strategies
Common Maintenance Practices

Reactive Maintenance

Run to Failure

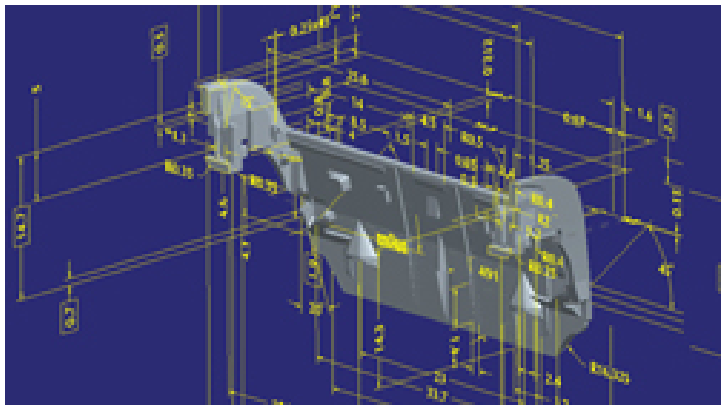
Preventive Maintenance

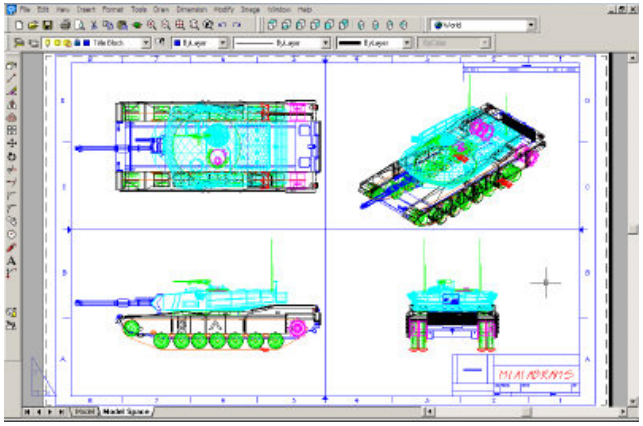
Service

Inspections

Alterative Maintenance

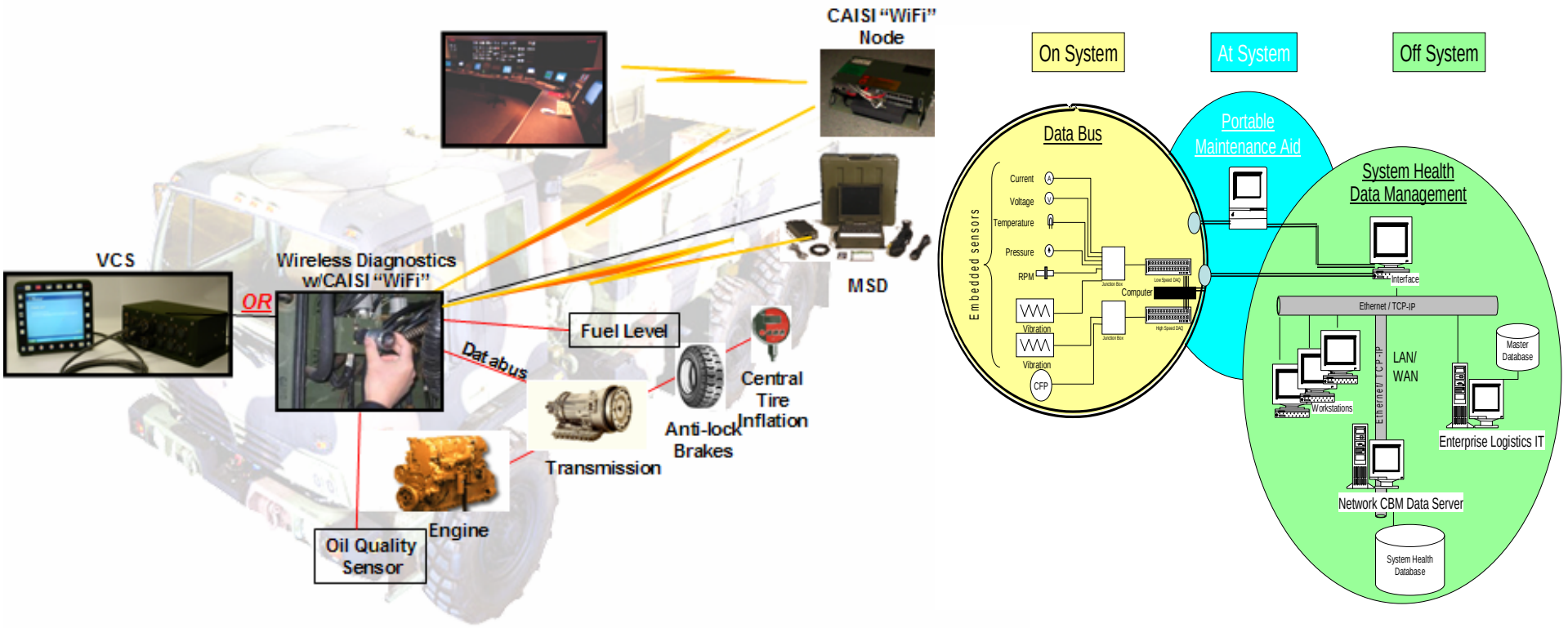
Redesign





TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Condition Based Maintenance Concept



Utilize ***onboard sensors, data collection***, networks, and computer resources to better enable the soldier and the Army to ***Maintain Vehicle Readiness and reduce cost*** by ***proactively pre-empting failures*** through predictive maintenance capabilities.

Understand Current Equipment Condition and Respond Proactively

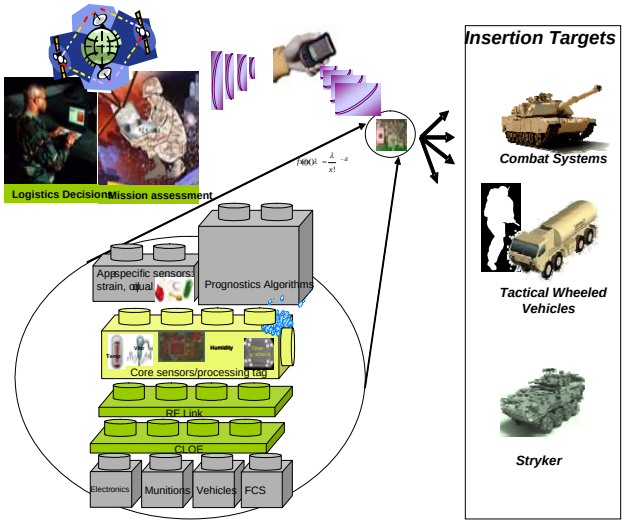
CBM – Technology Gaps

Vehicle

- Improved Sensors and Sensor Networks
  - Robust/Ruggedized
  - Temperature/Impact/Vibration
  - Low Cost
  - Self-Diagnosing
  - Power-Scavenging/Self-powered/Kinetic
  - Signal Processing
- Batteries, Brakes, Bearings, Belts, Tracks
  - Routine Maintenance
  - Low Hanging Fruit
- New and Innovative Sensing Techniques
  - Fusion/Reduction
  - Global Sensing
- Low Cost Computational Platforms
  - Headless Computers
  - Diagnostic/Prognostic Framework
  - Open Architecture
- Low Cost Data Acquisition Components
  - Multi Channel
  - Versatile
    - Multi Bus J1939/1553/J1708

Communication link to transfer information off platform

- Short range wireless - CAISI “WiFi”, ZigBee
- Long range wireless - SINCGARS, EPLRS, MTS
- Walk up, plug in port - Ethernet, USB, RS232
  - Bandwidth
  - **Security**



CBM – Technology Gaps

Back End

- Algorithms to Analyze and Act on Information Rapidly
  - Predictive Models
  - Self Learning
  - Predict the Unknowns
- Maintenance Centers, Data Warehouses, Enterprise Resource Planners
  - Fleet Level Usage Pattern Detection/Trend Analysis Across the Fleet
  - Logistic Footprint Prediction/Preposition Parts
  - Tactical Operation Optimization/Situational Awareness
    - Fuel and Ammo
- Statistical Analysis and Prognostics
  - Data reduction
  - Anomaly Detection
  - Data Mining

Currently Working with the University of Detroit

- Analyzing and Developing Wireless transceivers for sensors.
  - Wireless Methods Analysis IEEE 802.11, IEEE 802.15.4
- Program Expanded into Robotic Sensor Focus

CBM Reps at TARDEC Booth

- Tuesday, April 15

  Tom Udvare

  Chris Beck